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APPLICATION DEVICE AND RELATED METHOD

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[001] The present invention relates to a device and related method for dispensing and applying a product, such as, for example, a cosmetic product or a care product to a surface, such as, for example, skin, hair, toenails, fingernails.

[002] In particular, the invention relates to a device of the type comprising an application element for applying the product in combination with a reservoir for containing the product, wherein the device includes a cavity for receiving the application element. The cavity may be fed with product coming from the reservoir. The device may be relatively simple to use.

[003] In accordance with an optional aspect of the invention, a device for applying a product comprises a receptacle body defining a reservoir configured to contain a product and an application element configured to apply a product to a surface. The device also may comprise a cavity in flow communication with the reservoir and configured to receive the application element, and a support element on which the application element is mounted.

[004] The support element may be mounted to pivot relative to the receptacle body between a first position (e.g., a closed position) wherein the application element is received in the cavity and a second position (e.g., a ready position) wherein the application element is at least partially exposed so as to be capable of coming into contact with a surface to which product is to be applied.

[005] As used herein the terms "first" and "second" are used merely as a matter of convenience to designate two positions without being intended to imply there is any particular order in which the support element is moved from one position to the other. Moreover, although the device according to certain exemplary embodiments could be

capable of moving multiple times to and from the first and second positions, some exemplary embodiments could be arranged so there is only a single movement or a limited number of movements from one position to another during use.

[006] The receptacle body optionally may be adapted to be used as a handle for holding the application element during application of product to the surface. This may enable the support element for the application element to be compact.

[007] According to yet another optional aspect, the invention may include a device for applying a product, the device comprising a receptacle body defining a reservoir configured to contain a product and an application element configured to apply a product to a surface. A cavity may be in flow communication with the reservoir and configured to receive the application element. The device may further comprise a support element on which the application element is mounted. The support element may be mounted to move between a first position wherein the application element is received in the cavity and a second position wherein the application element is at least partially exposed so as to be capable of coming into contact with a surface to which product is to be applied. The receptacle body may be configured to be used as a handle portion for holding the device during application of product to the surface when the support element is in the second position.

[008] In yet another optional aspect of the invention, a device for applying a product comprises a receptacle body defining a reservoir configured to contain a product and an application element configured to apply a product. A cavity may be in flow communication with the reservoir and configured to receive the application element. The device may also comprise a support element on which the application element is mounted,

the support element being connected to the receptacle body. The support element may be mounted to move between a first position wherein the application element is received in the cavity and a second position wherein the application element is at least partially exposed so as to be capable of coming into contact with a surface to which product is to be applied. The support element may be configured to remain connected to the receptacle body in the second position.

[009] The device may permit the application element to be put into a position such that it is ready for use via an action that is relatively simple. For example, the action might substantially prevent a risk of the application element escaping and a risk that the application element comes into contact with a surface that might dirty it.

[010] The support element may be made integrally with a portion of the reservoir, thereby optionally reducing the number of component parts and simplifying manufacture of the device.

[011] Optionally, the support element may be configured to close the cavity when the support element is in the first position. The support element may be configured to hermetically seal the cavity when the support element is in the first position. Further, the device may comprise a sealing member configured to provide the hermetic sealing when the support element is in the first position.

[012] The support element may be configured to pivot over an angular movement that is at least approximately 120°. Optionally, the support element may be configured to pivot over an angular movement that is at least approximately 180°. This may enable the application element to be brought to a position in which it is thoroughly disengaged.

[013] Certain embodiments might be configured so that the support element moves between the first and second positions without any pivoting or with only a portion of the movement being pivotal. For example, the support element might move in a linear or curved path without any pivoting, and/or there could be an at least partial rotational motion.

[014] The application element may be made of any type of material. Optionally, the application element may be made of a compressible material, such as, for example, an open-celled foam. The application element may also optionally be made of either a semi-open celled or closed celled foam. Also optionally, the application element may be made of a sintered material. Further, the application element optionally may be absorbent.

[015] According to an optional aspect, the application element may be configured to be in a compressed configuration when the support element is in the first position (e.g., when the application element is received in the cavity). According to another optional aspect, the application element may be configured to be in an uncompressed configuration when the support element is in the first position.

[016] In an exemplary embodiment, a hinge member is associated with the support element and the support element is configured to pivot about the hinge member. The hinge member may comprise a film hinge. The device may further comprise a head portion associated with the receptacle body and the hinge member may connect the support element to the head portion. The hinge member optionally may connect the support element directly to the receptacle body. The hinge member may comprise at least one pivot configured to pivot in a housing. The hinge member may be configured to snap-fasten to at least one of the support element and the receptacle body. As an option, the hinge member may be spring-biased.

[017] The head portion may define a cavity. Optionally, the head portion may define an internal passage configured to place the cavity in flow communication with the reservoir. The receptacle body optionally may comprise a neck portion and the head portion may be configured to engage with the neck portion. As another option, the head portion and the receptacle body may be formed as a single piece. As yet another option, the head portion may be removably attached to the receptacle body.

[018] Optionally, the receptacle body is made of a relatively flexible material or a relatively rigid material.

[019] According to another optional aspect, the device may comprise a securing (e.g., locking) mechanism for securing the support element in the first position. The securing mechanism may be in the form of a snap-fastener and the support element may snap-fasten to the receptacle body when the support element is in the first position. Also optionally, the device may comprise a securing (e.g., locking) mechanism for securing the support element in the second position. The securing mechanism may be in the form of a snap-fastener and the support element may snap-fasten to the receptacle body when the support element is in the second position.

[020] As yet another option, a longitudinal axis of the cavity may be substantially parallel to a longitudinal axis of the receptacle body. The longitudinal axis of the cavity also may be substantially coincident with the longitudinal axis of the receptacle body. Also optionally, the longitudinal axis of the cavity may be at an angle relative to the longitudinal axis of the receptacle body. The longitudinal axis of the cavity also may be substantially perpendicular to the longitudinal axis of the receptacle body.

[021] The device may be configured such that flow of a product from the reservoir into the cavity is along a direction that is substantially perpendicular to the axis about which the support element is configured to pivot. The longitudinal axis of the application element optionally may be substantially parallel to a longitudinal axis of the receptacle body when the support element is in the second position. Also as an option, the longitudinal axis of the application element forms a non-zero angle with the longitudinal axis of the receptacle body when the support element is in the second position. Optionally, the longitudinal axis of the application element may be perpendicular to the longitudinal axis of the receptacle body when the support element is in the second position. The relative positions of the longitudinal axes of the application element and of the receptacle body may be selected so as to form an ergonomically suitable applicator device and may depend on the type of application desired.

[022] Optionally, the support element may be capable of pivoting through an angle of at least approximately  $210^{\circ}$  when the support element moves from the first position to the second position.

[023] The cavity optionally opens out substantially on a side that is opposite from the side where the application element is disposed when the support element is in the second position. This may make it possible to avoid the surface against which the application element is applied coming into contact with an edge of the cavity during application. Moreover, this may avoid the surface becoming coated in non-desired manner with a residue of the product present proximate the cavity.

[024] The cavity may be defined at least partially by a wall, such as a bottom wall, for example, defining at least one opening configured to provide flow communication

between the reservoir and the cavity. The at least one opening may be configured to permit flow of the product from the reservoir into the cavity so as to load the application element with the product when the support element is in the first position. Optionally, the wall may define a plurality of openings. Also optionally, the at least one opening may be at least one capillary opening.

[025] The application element may be compressible and the device may be configured such that product flows through the at least one opening during expansion of the application element from a compressed configuration to an uncompressed configuration when the support element moves from the first position to the second position. This may enable the application element to become loaded with the product from the reservoir.

[026] Optionally, the product flows into the cavity in a direction that is substantially perpendicular to the hinge axis of the support element.

[027] The application element optionally may be loaded with the product while in the cavity by capillarity or by exerting pressure on the receptacle body.

[028] Optionally, the device further comprises a product in the reservoir. The product may be chosen from a cosmetic product and a care product. A care product may be any type of care product for any type of surface. As an example, the care product may be a treatment product for a surface, such as, a body surface, for example.

[029] According to yet another optional aspect of the invention, a method of applying a product to a surface comprises providing a device, such as any of the devices described above, and flowing a product toward the cavity to place the product in contact with at least a portion of the application element positioned in the cavity so as to load at



[030] As mentioned above, the method comprises “providing” a device. The term “providing” is used in a broad sense, and refers to, but is not limited to, making available for use, enabling usage, giving, supplying, obtaining, getting a hold of, acquiring, purchasing, selling, distributing, possessing, making ready for use, and/or placing in a position ready for use.

[032] The flowing of the product from the reservoir to the cavity may comprise exerting pressure on an outside of the receptacle body. Alternatively, the application element may be compressible and the flowing of the product toward the cavity may optionally comprise permitting the application element to expand from a compressed configuration to an uncompressed configuration.

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the first position. The securing of the support element in the first position may comprise snap-fastening the support element relative to the receptacle body.

[034] The flowing of the product toward the cavity optionally may comprise flowing the product through at least one opening defined in a wall defining the cavity.

[035] As an option, the placing of the application element in contact with the surface may comprise placing the application element in contact with at least one of skin, hair, at least one toenail, and at least one fingernail.

[036] The devices and methods of dispensing described herein may optionally solve some or all of the problems discussed above. It should be understood that the invention could be practiced without performing one or more of the aspects and/or advantages described above. Aside from the structural and procedural arrangements set forth above, the invention could include a number of other arrangements, such as those explained hereinafter. It is to be understood that both the foregoing description and the following description are exemplary.

[037] The accompanying drawings are incorporated in and constitute a part of this specification. The drawings illustrate exemplary embodiments of the invention and, together with the description, serve to explain some principles of the invention. In the drawings,

[038] Fig. 1 is a perspective view of a first exemplary embodiment of an application device according to the invention;

[039] Fig. 2 is a cross-sectional view of the device of Fig. 1 taken along line I-I with a support element shown in a first position;

[040] Fig. 3 is a cross-sectional view of a second exemplary embodiment of an application device with the support element shown in a first position;

[041] Fig. 4 is a cross-sectional view of the device of Fig. 3 with the support element shown in a second position;

[042] Fig. 5 is a partial cross-sectional view of a third exemplary embodiment of an application device;

[043] Fig. 6 is a cross-sectional view of the device of Fig. 5 showing the support element in the second position; and

[044] Fig. 7 is a cross-sectional view of a fourth exemplary embodiment of an application device.

[045] Reference will now be made in detail to exemplary embodiments of the invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers are used in the drawings and the description to refer to the same or like parts.

[046] Fig. 1 shows an applicator device 10 according to a first exemplary embodiment of the invention. The device 10 optionally is intended for dispensing and applying a cosmetic or care product, for example a lotion or a sun cream. The device 10 may be used to apply any substance of fluid to pasty consistency, or optionally a powder.

[047] The device 10, shown partially in axial cross-section in Fig. 2, may comprise a receptacle body 11 having a longitudinal axis X and a head portion 12 on the receptacle body 11. The head portion 12 may define a cavity 13 in which an application element 14 may be received. The body 11 may define a reservoir for containing a product to be applied.

[048] The cavity 13 optionally may be defined by a side wall 15 and by a bottom wall 16. The bottom wall 16 may be provided with one or more openings 17 in flow communication with the reservoir defined by the body 11. An internal passage 18 defined by the head portion 12 may place the openings 17 and the reservoir in flow communication.

[049] The head portion 12 may include a skirt portion 19, optionally configured to snap-fasten on a neck portion 20 of the body 11. The neck portion 20 optionally may be formed integrally as a single piece with the body 11. The neck 20 also may be provided with a sealing lip 21 suitable for pressing in leakproof manner against the neck portion 20 so as to provide leakproof communication between the internal passage 18 and the reservoir defined by the body 11. The head portion 12 optionally may be formed with the receptacle body 11 as a single piece.

[050] Optionally, the body 11 has a flexible wall so as to enable a user to expel the substance into the internal passage 18 and into the openings 17 by exerting pressure on the receptacle body, for example by pressing against the flexible wall.

[051] The application element 14 may be carried by a support element 23. The support element 23 may be in the form of a flap provided on one side with two pivots 25 engaged in appropriate housings formed in the head portion 12. The support element 23 may have a sealing lip 28 suitable for bearing in leakproof manner against the side wall 15 when the support element 23 is in a closed position, as shown in Fig. 2, so as to close the cavity 13, optionally hermetically sealing the cavity. The support element 23 also has a securing mechanism 38 suitable for snap-fastening in a recess 39 of the head portion 12 in order to hold the support element 23 in the closed position.

[052] The application element 14 may optionally be made of an open-celled foam, and may be fixed in an assembly skirt 30 formed integrally with the support element 23. It can be seen that in the embodiment of Figs. 1 and 2, the axis Y of the cavity 13 is substantially perpendicular to the axis X of the receptacle body 11.

[053] A recess 31 optionally may be formed in the head 12 in line with the support element 23 so as to enable the user to insert a fingernail, or the like, to lift the support element 23 and cause it to pivot through approximately 120° about a pivot axis K.

[054] On its side opposite from the body 11, the head portion 12 may have a housing 34 arranged to receive the support element 23 in an open position. The edge of the housing 34 remote from the pivot axis K may define a small relief portion 35 enabling the support element 23 to be held in its open position by snap-fastening.

[055] According to an optional aspect, the device may be used as follows. The user may begin by loading the application element 14 with product by exerting pressure on the receptacle body 11. The user may then pivot the support element 23 so as to bring it into the housing 34, after which the body 11 can be used as a handle while applying the substance to the skin, the hair, the nails, or the mucous membranes using the application element 14.

[056] Various modifications may be made without going beyond the ambit of the present invention. For example, the way in which the application element is filled with product can be modified. For example, the application element may be compressible and the product may be loaded onto the application element as a result of expansion of the application element as the support element moves from a closed position to an open,

[057] Moreover, the orientation of the axis of the housing in which the application element is received or the axis of the application element when it is in its ready position may be altered, for example, as a function of the kind of substance to be applied, of the zone of the body or the face to be treated, and of the desired manner of application.

[059] The body 41 may be associated with a neck portion 45 on an axis X. The axis Y of the cavity 43 may be at a non-zero angle of less than approximately 90° relative to the axis X.

[061] The cavity 43 may be defined by a side wall 47 and by a bottom wall 48. The bottom wall 48 may define openings 49 for feeding the cavity 43 with product so as to load the application element 44. The application element 44 may be fixed to a support element 53, for example in the form of a flap, that optionally is connected via a film hinge 54 to a front wall 55 of the head portion 42.

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[063] The front wall 55 may have a cut-out portion 62 in which a stud 63 secured to the support element 53 may be snap-fastened after the support element 53 has been pivoted so as to place the application element in its ready position, as shown in Fig. 4.

[064] It will be observed that in the embodiment of Figs. 3 and 4, the axis Z of the application element when in its ready position is at an angle of more than 90° relative to the axis Y of the cavity 43. In this way, when the user applies the product while using the body 41 as a handle, the cavity 43 faces away from the application element 44. This may ensure that the surface to which the product is applied does not come into contact with the edges of the cavity 43.

[065] Figs. 5 and 6 show a device 70 according to yet another exemplary embodiment of the invention. The device 70 comprises a receptacle body 71 having a head portion 72 mounted thereon. The head portion 72 may define a cavity 73 configured to receive an application element 74 that may be carried by a support element (e.g., flap) 75. The head portion 72 may include a sealing lip 76 that bears in a substantially leakproof manner against a neck portion 67 associated with the body 71.

[066] The cavity 73 may be supplied with product from the reservoir defined by body 71 through openings 79.

[067] The head portion 72 optionally has a bearing surface 80 against which the support element 75 comes to bear after pivoting through about  $210^\circ$ , as shown in Fig. 6. The support element 75 may be connected to the head portion 72 via a film hinge 82.

[068] The support element 75 may have a cutout portion 83 in which a stud 84 formed on the bearing surface 80 can be snap-fastened so as to suitably hold the support element 75 in the ready position.

[069] The support element 75 also optionally has a sealing lip 86 suitable for engaging in leakproof manner in an annular groove 87 formed in the head portion 72. This may permit the cavity 73 to be closed hermetically.

[070] The support element 75 may have a securing mechanism 89 suitable for snap-fastening in a recess 90 of the head portion 72 in order to hold the support element in the closed position.

[071] In the embodiment of Figs. 6 and 7, the axis of the cavity 73 coincides with the axis X of the receptacle body. Also, the axis Z of the applicator element may make an angle of about 60° with the axis X when in the support element is in the ready position.

[072] The hinge 82 connecting the support element 75 to the receptacle body 71, when implemented in the form of a film hinge, may include an end portion suitable for being fitted onto the receptacle body 71.

[073] By way of illustration, Fig. 7 shows an applicator device 100 that includes a support element 101 molded together with a film hinge 102. The hinge 102 optionally may include an end portion 103 fixed by snap-fastening in a housing 104 of a head portion 105 similar to the above-described head portion 42. The housing 104 may lie on the axis X of the receptacle body.

[074] The film hinge 102 may be molded in an unfolded state, which may make it easier to manufacture the support element.



[075] The hinge member 102 also may be made in the form of a hinge that provides a spring effect, tending to hold the support element in one of the closed position and the ready position. Such a spring effect hinge may include an elastically deformable portion which passes through a maximum amount of stress when the hinge is in an intermediate angular position between its extreme positions.

[076] The invention is not limited to the embodiments described above. In particular, it is possible to use application elements of varying kinds and shapes, which may differ from those described above. For example, application elements that are compressible or otherwise, foams, sintered elements, or felts may be provided.

[077] Moreover, the application element may be loaded with product in various ways. In particular, the application element may be loaded with product other than by exerting pressure on the wall of the receptacle so as to expel product toward the application element by means of said pressure. The application element may be loaded with product by gravity and/or by capillarity and/or by means of a pump which extracts product from the reservoir and delivers it to the application element. The application element also may be filled with product by a suction effect caused by the application element shrinking while it is in the cavity, with such an effect being caused by the application element being compressed in a leakproof manner against the side wall of the cavity.

[078] The application element optionally may come into contact with the wall defining the corresponding cavity when the support element is in the first (i.e., closed) position.

[079] Further, although the devices and methods have been described herein in conjunction with applying a cosmetic or care product to hair, skin, and/or nails, it is contemplated that the devices and methods can be employed to apply virtually any product to any type of surface. For example, the devices and methods could be used to apply shoe polish to shoes or to apply paint.

[080] It will be apparent to those skilled in the art that various modifications and variations can be made to the structure and methodology of the present invention. Thus, it should be understood that the invention is not limited to the examples discussed in the specification. Rather, the present invention is intended to cover modifications and variations.